

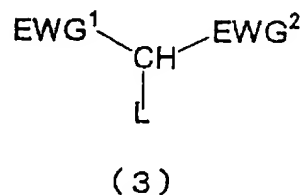
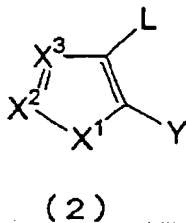
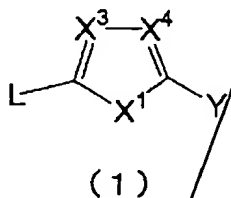
WHAT IS CLAIMED IS:

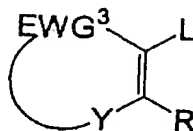
Sub a1

1. A method for forming an azo colorant, wherein a coupler having a leaving group at a coupling position thereof and a diazo compound are used, and the method has a faster coupling reaction rate than an azo dye-forming reaction between the diazo compound and the coupler having a hydrogen atom at the coupling position.

2. A method for forming an azo colorant, wherein a coupler having a leaving group at a coupling position thereof and a diazo compound are used, and the method has a coupling reaction rate constant k of at least 0.1 s^{-1} .

3. The method for forming an azo colorant according to claim 1, wherein the coupler has a structure represented by one of general formulae (1), (2), (3), (4), and (5) as follows.





(4)

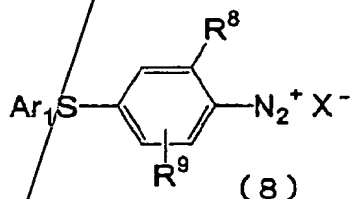
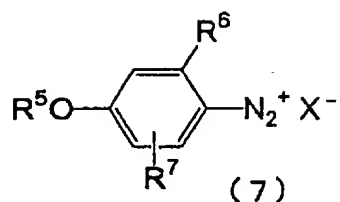
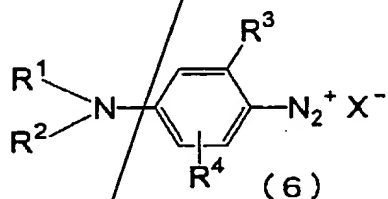


(5)

in which X^1 , X^2 , X^3 , and X^4 each independently represents an atomic group necessary for forming a five-membered aromatic heteroring; Y represents one of a hydroxyl group, an amino group which may have a substituent, an alkyl group which may have a substituent, an aryl group which may have a substituent, an alkoxy group which may have a substituent, and an aryloxy group which may have a substituent; R represents one of a hydroxyl group, an alkyl group which may have a substituent, an aryl group which may have a substituent, an alkoxy group which may have a substituent, an aryloxy group which may have a substituent, an amino group which may have a substituent, an alkylthio group which may have a substituent, and an arylthio group which may have a substituent; Z represents one of a hydroxyl group and an amino group which may have a substituent; Ar represents a benzene ring, naphthalene ring, pyridine ring or quinoline ring, each of which may have a substituent; L represents a substituent that is releasable at a time of coupling with the diazo compound; EWG¹, EWG² and EWG³ each independently represents an electron-attractive group; and pairs, X^1 and Y, EWG¹

and EWG², and Y and R may each link with each other to form a ring.

4. The method for forming an azo colorant according to claim 3, wherein the diazo compound is a compound represented by one of general formulae (6), (7), and (8) as follows.



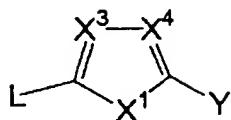
in which, in general formulae (6) and (7): R¹ and R² each represents one of a hydrogen atom and an alkyl group which may have a substituent; R¹ and R² may link with each other to form a heterocycle; R¹ and R² cannot both be hydrogen atoms; R³ represents one of an alkyl group which may have a substituent, an alkoxy group which may have a substituent, an aryloxy group which may have a substituent, an alkylthio group which may have a

substituent, an arylthio group which may have a substituent, an alkylsulfonyl group which may have a substituent, and an arylsulfonyl group which may have a substituent; R^4 represents one of a hydrogen atom, an alkyl group which may have a substituent, and an alkoxy group which may have a substituent; R^5 represents one of a hydrogen atom and an alkyl group which may have a substituent; R^6 and R^7 each represents one of an alkyl group which may have a substituent, an alkoxy group which may have a substituent, an aryloxy group which may have a substituent, an alkylthio group which may have a substituent, and an arylthio group which may have a substituent; R^6 and R^7 may be the same and may be different from each other; and X^- represents an acid anion, and

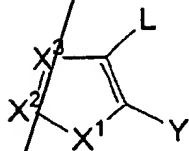
in the general formula (8): Ar^1 represents an aryl group which may have a substituent; R^8 and R^9 each represents one of an alkyl group which may have a substituent, an aryl group which may have a substituent, an alkoxy group which may have a substituent, and an aryloxy group which may have a substituent; R^8 and R^9 may be the same and may be different from each other; and X^- represents an acid anion.

5. The method for forming an azo colorant according to claim 2, wherein the coupler has a structure

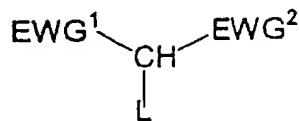
represented by one of general formulae (1), (2), (3), (4), and (5) as follows.



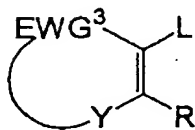
(1)



(2)



(3)



(4)

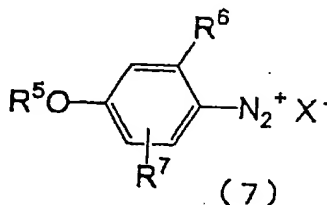
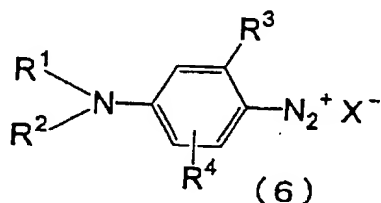


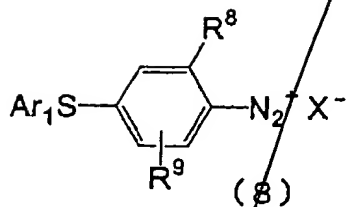
(5)

in which X^1 , X^2 , X^3 , and X^4 each independently represents an atomic group necessary for forming a five-membered aromatic heteroring; Y represents one of a hydroxyl group, an amino group which may have a substituent, an alkyl group which may have a substituent, an aryl group which may have a substituent, an alkoxy group which may have a substituent, and an aryloxy group which may have a substituent; R represents one of a hydroxyl group, an alkyl group which may have a

substituent, an aryl group which may have a substituent,
 an alkoxy group which may have a substituent, an aryloxy
 group which may have a substituent, an amino group which
 may have a substituent, an alkylthio group which may
 have a substituent, and an arylthio group which may have
 a substituent; Z represents one of a hydroxyl group
 and an amino group which may have a substituent; Ar
 represents a benzene ring, naphthalene ring, pyridine
 ring or quinoline ring, each of which may have a
 substituent; L represents a substituent that is
 releasable at a time of coupling with the diazo compound;
 EWG¹, EWG² and EWG³ each independently represents an
 electron-attractive group; and pairs, X¹ and Y, EWG¹
 and EWG², and Y and R may each link with each other to
 form a ring.

6. The method for forming an azo colorant
 according to claim 5, wherein the diazo compound is a
 compound represented by one of general formulae (6),
 (7), and (8) as follows.





in which, in general formulae (6) and (7): R¹ and R² each represents one of a hydrogen atom and an alkyl group which may have a substituent; R¹ and R² may link with each other to form a heterocycle; R¹ and R² cannot both be hydrogen atoms; R³ represents one of an alkyl group which may have a substituent, an alkoxy group which may have a substituent, an aryloxy group which may have a substituent, an alkylthio group which may have a substituent, an arylthio group which may have a substituent, an alkylsulfonyl group which may have a substituent, and an arylsulfonyl group which may have a substituent; R⁴ represents one of a hydrogen atom, an alkyl group which may have a substituent, and an alkoxy group which may have a substituent; R⁵ represents one of a hydrogen atom and an alkyl group which may have a substituent; R⁶ and R⁷ each represents one of an alkyl group which may have a substituent, an alkoxy group which may have a substituent, an aryloxy group which may have a substituent, an alkylthio group

add
which may have a substituent, and an arylthio group which may have a substituent; R^6 and R^7 may be the same and may be different from each other; and X^- represents an acid anion, and

in the general formula (8): Ar^1 represents an aryl group which may have a substituent; R^8 and R^9 each represents one of an alkyl group which may have a substituent, an aryl group which may have a substituent, an alkoxy group which may have a substituent, and an aryloxy group which may have a substituent; R^8 and R^9 may be the same and may be different from each other; and X^- represents an acid anion.

7. The method for forming an azo colorant according to claim 1, wherein a reducing agent is utilized.

8. The method for forming an azo colorant according to claim 1, wherein a base is utilized.

9. The method for forming an azo colorant according to claim 3, wherein, in the general formulae (1), (2), (3), (4), and (5), L is one of a halogen atom, an alkylthio group which may have a substituent, an arylthio group which may have a substituent, an alkyl group which may have a substituent, an alkoxy group which may have a substituent, an aryloxy group which may have a substituent, an arylsulfonyloxy group which may have

a substituent, an acyloxy group which may have a substituent, a benzyloxy group which may have a substituent, a dialkylaminocarbonyloxy group which may have a substituent, a diarylaminocarbonyloxy group which may have a substituent, an alkoxycarbonyloxy group which may have a substituent, an aryloxy carbonyloxy group which may have a substituent, an N-pyrazolyl group which may have a substituent, an N-imidazolyl group which may have a substituent, and an N-benzotriazolyl group which may have a substituent.

10. The method for forming an azo colorant according to claim 2, wherein a reducing agent is utilized.

11. The method for forming an azo colorant according to claim 2, wherein a base is utilized.

12. The method for forming an azo colorant according to claim 5, wherein, in the general formulae (1), (2), (3), (4), and (5), L is one of a halogen atom, an alkylthio group which may have a substituent, an arylthio group which may have a substituent, an alkyl group which may have a substituent, an alkoxy group which may have a substituent, an aryloxy group which may have a substituent, an arylsulfonyloxy group which may have a substituent, an acyloxy group which may have a substituent, a benzyloxy group which may have a

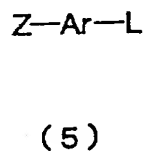
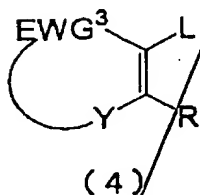
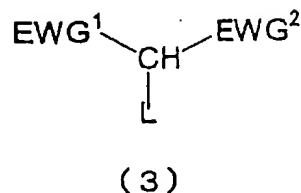
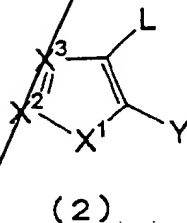
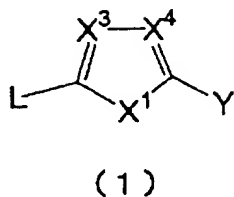
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substituent, a dialkylaminocarbonyloxy group which may have a substituent, a diarylaminocarbonyloxy group which may have a substituent, an alkoxycarbonyloxy group which may have a substituent, an aryloxycarbonyloxy group which may have a substituent, an N-pyrazolyl group which may have a substituent, an N-imidazolyl group which may have a substituent, and an N-benzotriazolyl group

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13. A recording material comprising a support and, on the support, at least one recording layer containing a diazo compound and a coupler which reacts with the diazo compound for developing color, wherein the coupler has a leaving group at a coupling position thereof.

14. A recording material comprising a support and, on the support, at least one recording layer containing a diazo compound and a coupler, which reacts with the diazo compound for developing color, wherein the coupler has a leaving group at a coupling position thereof, the diazo compound and the coupler have a faster coupling reaction rate therebetween than in a case of the coupler having a hydrogen atom at a coupling position, and a coupling reaction rate constant k therebetween is at least 0.1 s^{-1} .

15. The recording material according to claim 13,

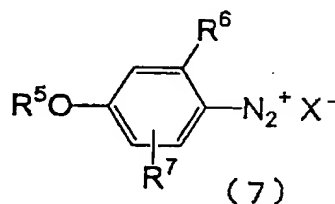
wherein the coupler has a structure represented by one of general formula (1), (2), (3), (4) and (5).



in which x^1 , x^2 , x^3 , and x^4 each independently represents an atomic group necessary for forming a five-membered aromatic heteroring; Y represents one of a hydroxyl group, an amino group which may have a substituent, an alkyl group which may have a substituent, an aryl group which may have a substituent, an alkoxy group which may have a substituent, and an aryloxy group which may have a substituent; R represents one of a hydroxyl group, an alkyl group which may have a substituent, an aryl group which may have a substituent, an alkoxy group which may have a substituent, an aryloxy group which may have a substituent, an amino group which

AZ
cut

Abstract



in which, in general formulae (6) and (7): R^1 and R^2 each represents one of a hydrogen atom and an alkyl group which may have a substituent; R^1 and R^2 may link with each other to form a heterocycle; R^1 and R^2 cannot both be hydrogen atoms; R^3 represents one of an alkyl group which may have a substituent, an alkoxy group which may have a substituent, an aryloxy group which may have a substituent, an alkylthio group which may have a substituent, an arylthio group which may have a substituent, an alkylsulfonyl group which may have a substituent, and an arylsulfonyl group which may have a substituent; R^4 represents one of a hydrogen atom, an alkyl group which may have a substituent, and an alkoxy group which may have a substituent; R^5 represents one of a hydrogen atom and an alkyl group which may have a substituent; R^6 and R^7 each represents one of an alkyl group which may have a substituent, an alkoxy group which may have a substituent, an aryloxy group which may have a substituent, an alkylthio group which may have a substituent, and an arylthio group which may have a substituent; R^6 and R^7 may be the same and may be different from each other; and X^- represents an acid anion, and

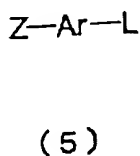
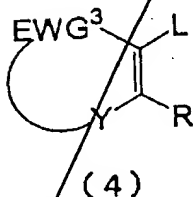
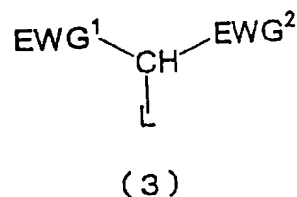
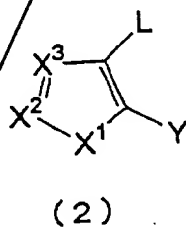
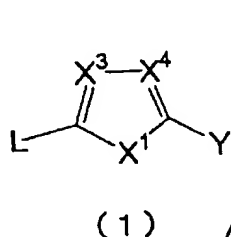
in the general formula (8): Ar^1 represents an

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could

aryl group which may have a substituent; R^8 and R^9 each represents one of an alkyl group which may have a substituent, an aryl group which may have a substituent, an alkoxy group which may have a substituent, and an aryloxy group which may have a substituent; R^8 and R^9 may be the same and may be different from each other; and X^- represents an acid anion.

17. The recording material according to claim 13, wherein the diazo compound is contained in a microcapsule.

18. The recording material according to claim 14, wherein the coupler has a structure represented by one of general formula (1), (2), (3), (4) and (5).



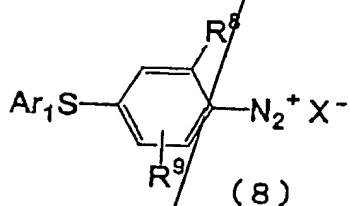
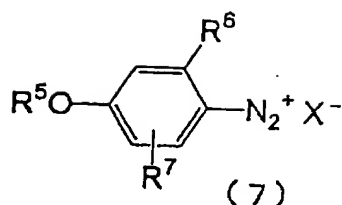
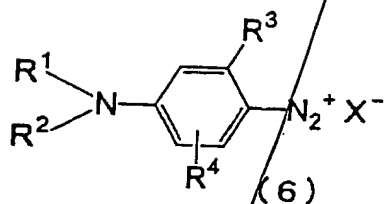
in which X^1 , X^2 , X^3 , and X^4 each independently

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represents an atomic group necessary for forming a five-membered aromatic heteroring; Y represents one of a hydroxyl group, an amino group which may have a substituent, an alkyl group which may have a substituent, an aryl group which may have a substituent, an alkoxy group which may have a substituent, and an aryloxy group which may have a substituent; R represents one of a hydroxyl group, an alkyl group which may have a substituent, an aryl group which may have a substituent, an alkoxy group which may have a substituent, an aryloxy group which may have a substituent, an amino group which may have a substituent, an alkylthio group which may have a substituent, and an arylthio group which may have a substituent; Z represents one of a hydroxyl group and an amino group which may have a substituent; Ar represents a benzene ring, naphthalene ring, pyridine ring or quinoline ring, each of which may have a substituent; L represents a substituent that is releasable at a time of coupling with the diazo compound; EWG¹, EWG² and EWG³ each independently represents an electron-attractive group; and pairs, X¹ and Y, EWG¹ and EWG², and Y and R may each link with each other to form a ring.

19. The recording material according to claim 18, wherein the diazo compound is represented by one of

general formula (6), (7) and (8).



in which, in general formulae (6) and (7): R^1 and R^2 each represents one of a hydrogen atom and an alkyl group which may have a substituent; R^1 and R^2 may link with each other to form a heterocycle; R^1 and R^2 cannot both be hydrogen atoms; R^3 represents one of an alkyl group which may have a substituent, an alkoxy group which may have a substituent, an aryloxy group which may have a substituent, an alkylthio group which may have a substituent, an arylthio group which may have a substituent, an alkylsulfonyl group which may have a substituent, and an arylsulfonyl group which may have a substituent; R^4 represents one of a hydrogen atom, an alkyl group which may have a substituent, and an

alkoxy group which may have a substituent; R^5 represents one of a hydrogen atom and an alkyl group which may have a substituent; R^6 and R^7 each represents one of an alkyl group which may have a substituent, an alkoxy group which may have a substituent, an aryloxy group which may have a substituent, an alkylthio group which may have a substituent, and an arylthio group which may have a substituent; R^6 and R^7 may be the same and may be different from each other; and X^- represents an acid anion, and

in the general formula (8): Ar^1 represents an aryl group which may have a substituent; R^8 and R^9 each represents one of an alkyl group which may have a substituent, an aryl group which may have a substituent, an alkoxy group which may have a substituent, and an aryloxy group which may have a substituent; R^8 and R^9 may be the same and may be different from each other; and X^- represents an acid anion.

20. The recording material according to claim 14, wherein the diazo compound is contained in a microcapsule.